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AGROTECHNOLOGY AND FOOD RESOURCES

Soviets Test New Method for Detecting Toxin in Grain: A new microscopic method developed by the Soviets to detect a toxin-producing fungus in rose-colored grain will be tested in 1975-76. Recent Soviet investigations have shown that the visual detection method now used by the Ministry of Procurement is inadequate and that most rose-colored grain is actually nontoxic and retains all its qualities.

In the European USSR freshly harvested wheat and rye frequently contains rose-colored grain, which was considered to be an indication of contamination with a fungus highly toxic to man. Grain with more than 1% contamination could not be procured except with state approval and only then for limited industrial use. In 1974 in one oblast more than 145,000 tons were sent to grain reception centers. Procurement restrictions in the affected regions resulted in loss of farm income, large accumulations of grain at farms and spoilage during storage.

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Comment: Soviet use of a superficial detection method apparently has resulted in the loss or highly restricted use of significant quantities of nontoxic, quality grain over many years. Microscopic examination of grain samples can positively identify the difference between toxic and nontoxic rose-colored grain. Soviet use of this type examination should free significant quantities of formerly rejected grain for food purposes.

The Soviets have good reason for concern about toxic contamination of grain. During the 1942-47 period, a highly lethal toxin (probably trichothecene) causing alimentary toxic aleukia (ATA) in man was found in grain over a wide area in Southwest Russia. (ATA is a disease affecting the blood cells and can lead to heart failure.) Instances of human and animal poisoned from consumption of grain contaminated with toxin-producing fungi have occurred sporadically since 1950.

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BEHAVIORAL SCIENCES

Expansion of Soviet Human Factors Program Planned: B. F. Lomov, head of the Institute of Psychology of the Academy of Sciences, USSR.

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Comment: The various laboratories in Lomov's institute appear to be performing research that is highly relevant to the successful solution of current complex man-machine system integration problems. Work reportedly is being conducted on: control panel design problems; information processing; scaling of sensory thresholds; mathematical modeling of operator activity, and man's adaptability to weightlessness. Significant results of this research could have a direct impact on Soviet weapon design programs and manned space flight programs.

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Expansion of scientific manpower for these programs should enhance Soviet ability to conduct successful human factors programs in the future design of complex systems.

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PHYSICAL SCIENCES AND TECHNOLOGIES

Increased Hungarian Magnetic Bubble Technology Will Probably Benefit Soviets: Leonard Pal, Director of the Central Research Institute for Physics, Hungary, stated that gadolinium gallium garnet (G³) substrates are being made in Hungary using a furnace built in the UK. Additional furnaces are being purchased from the UK, and all furnaces will be housed in a facility to be opened in January 1976. G³ substrate production is under the direction of Georgy Zimmer. [REDACTED]

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Comment: Magnetic bubble technology is a potential competitor with other technologies such as charge couple devices for advanced computer storage or auxiliary memories. Epitaxial garnets grown on G³ substrates are considered the best material for high data rate, reliable magnetic bubble devices. The increase in Hungary's capability would make them the main supplier of G³ substrates among the Soviet bloc nations and particularly the USSR. Soviet magnetic bubble specialists have been unsuccessful in obtaining adequate quantities of G³ substrates from their own crystal growers and have turned to the Hungarians as potential suppliers.

The Hungarian capability has been enhanced not only by the acquisition of furnaces from the UK but also by the fact that Zimmer studied magnetic bubble technology in the US prior to taking over the G³ substrate production effort. [REDACTED]

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Soviets Describe Potential Sonar Signal Processor Containing an FFT Special Purpose Computer: In a recent Soviet book on shipboard noise analysis and reduction, a measuring and monitoring processor including a small, special purpose fast Fourier transform (FFT) computer is described. The article strongly suggests that at least one processor exists. The article deals mostly with the interface and control components, which apparently are not based heavily on integrated circuit technology.

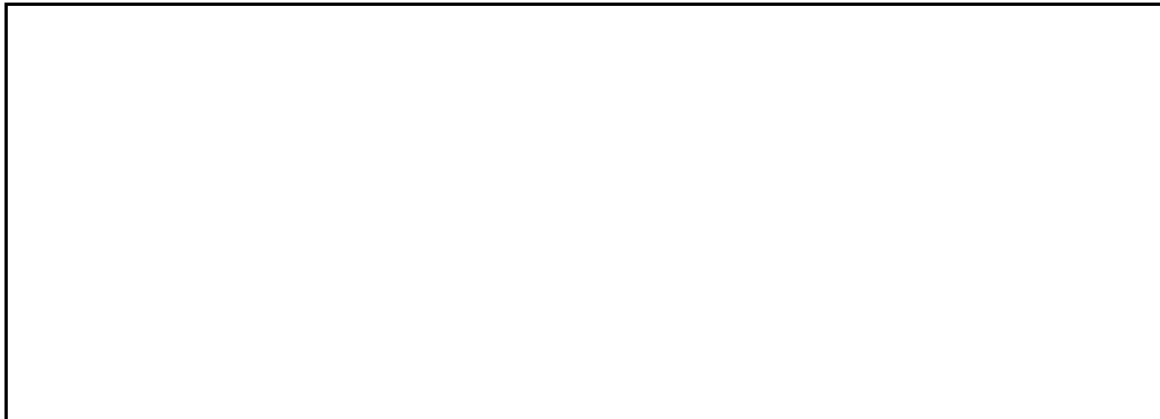
The system reportedly is capable of handling up to several hundred inputs (including telemetered inputs from remote points), performing various statistical calculations, automatically controlling operations, and simul-

taneously executing algorithms for alert, search, and standard functions. [REDACTED]

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Comment: Although the FFT computer was not described, the described system is directly applicable, with possibly only minor changes, to sonar signal processing. There are no specific indicators of this new processor's capability, but the incorporation of a small special purpose FFT computer in the processor is a step toward high speed, large data quantity, versatile signal processing. A nation's sonar signal processing capability now depends heavily on the quantity and speed of data handling by the machine and the man-machine interface and the functions and performance of the algorithms executed.

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